

SPECIAL DRINKING WATER QUALITY REPORT EAST TENNESSEE TECHNOLOGY PARK

September 20, 2000



Department of Energy
Oak Ridge Operations

Your Water is Safe!



Community Reuse
Organization of East Tennessee

We are happy to inform the workers at the East Tennessee Technology Park (ETTP) and concerned members of the public that the drinking water at the site is, indeed, *safe to drink*. The drinking water system is operated by Operations Management International, Inc. (OMI), a professional private utility operations firm that operates drinking water systems throughout the world. This report summarizes the results of this special sampling and testing effort recently completed by the Sampling Planning and Oversight Team (SPOT). More data is available to those who wish to see all of the test results in the Department of Energy (DOE) Oak Ridge Operations (ORO) Reading Room. These results confirm there are no levels of contaminants in the drinking water that exceed published Environmental Protection Agency (EPA) and State regulated levels.

As a result of concerns expressed by sick workers at the July 31, 2000, public meeting held to present the findings of Drs. Lockey, Bird, and Freeman, SPOT was created as a first-of-its-kind team for DOE-ORO to plan and manage this sampling initiative. This innovative approach was taken to assure workers and the public that this effort would be conducted with the utmost integrity in obtaining and presenting the results. The team is comprised of representatives from DOE; OMI; Community Reuse Organization of East Tennessee (CROET); Paper, Allied-Industrial, and Chemical Employees Union (PACE), Local Oversight Committee Citizens Advisory Panel (LOC-CAP), Tennessee Department of Environment and Conservation (TDEC), and Bechtel Jacobs Company LLC (BJC). In addition, replicate sampling was conducted by the EPA and their results are being reported separately.

Results of Sampling Initiative

The drinking water for the ETTP comes from the Drinking Water Treatment Plant (K-1515) located on Bear Creek Road, which draws raw water from the Clinch River. An overview of the special test results for bacteriological, chemical, and radiological testing for the finished water from the treatment plant, as well as 18 other drinking water locations at ETTP, are provided in Table 1. Provided here are the results where there were measurable levels as opposed to being reported by the laboratory as below detectable limits (BDL). See Table 2 for analytes tested for and not detected.

Chemical and radiological analyses are routinely performed on the “finished” water from the treatment plant as required by the State of Tennessee and the EPA. The State also requires monthly testing for bacteria and chlorine at the treatment plant and from four locations within the distribution system (i.e., “at the tap”). OMI voluntarily collects an additional 26 samples per month from the distribution system and performs bacteria and chlorine analyses in their on-site lab. Lead and copper testing are performed at locations in the distribution system every three years in accordance with regulatory requirements.

This one-time initiative led by SPOT to test for metals, chemicals, and radionuclides in water taken at the tap goes well above-and-beyond regulatory requirements. This summary does not reflect the data from any regulatory testing, however, it is consistent with that data. The team undertook this massive sampling effort to assure the workers and members of the public the drinking water at ETTP is safe to drink, despite the fact that ETTP maintains a State-approved cross-connection control program. Over 475 drinking water samples were collected by the team and submitted for laboratory analysis at State-certified laboratories. The EPA collected replicate samples at seven of the sites selected and tested at their discretion.

As shown in Table 1, ETTP Drinking Water Quality Summary, the ETTP drinking water had no violations for compounds that have primary Maximum Contaminant Levels (MCLs) and it meets all Federal and State requirements. Note that secondary MCLs, which are related only to aesthetic properties of water and do not pose a health risk, were exceeded for iron and manganese in one drinking water sample out of the 19 locations sampled. (See Note 2 in Table 1.)

Contaminant	Highest Level Allowed (MCL)	Health Goal (MCLG)	Aesthetic Goal (SMCL)	Detected in How Many Samples	Average of Detected Amounts	Amounts Detected		Meets Standards
						Low est	Highest	
Total Coliform	0	0	-	5 of 34	N/A	See Note 1		YES
Asbestos (mf/L)	7	7	-	1 of 19	0.18	BDL	0.18	YES
Barium	2	2	-	19 of 19	0.04	0.04	0.05	YES
Chloride	-	-	250	19 of 19	13	12	14	YES
Chloromethane	-	-	-	7 of 19	0.0006	BDL	0.0007	N/R
Chromium	0.1	0.1	-	1 of 19	0.003	BDL	0.0026	YES
Color (Color Units)	-	-	15	19 of 19	1	1	1	YES
Copper	1.3	1.3	1.0	3 of 19	0.072	BDL	0.150	YES
Dioxin (pg/L)	30	0	-	3 of 19	3.2	BDL	5.7	YES
Dissolved Solids	-	-	500	19 of 19	172	150	200	YES
Fluoride	4	4	-	19 of 19	0.23	0.21	0.24	YES
Gross Alpha (pCi/L)	15	-	-	1 of 19	0.61	BDL	0.61	YES
Gross Beta (pCi/L)	4 mrems/yr (50 pCi/L)	-	-	13 of 19	2.6	BDL	3.3	YES
Iron	-	-	0.3	14 of 19	0.13	BDL	0.88	See Note 2
Lead	0.015	0	-	2 of 19	0.001	BDL	0.002	YES
Manganese	-	-	0.05	4 of 19	0.054	BDL	0.180	See Note 2
Methylene Chloride	-	-	-	2 of 19	0.0012	BDL	0.0013	N/R
Nitrate	10	10	-	18 of 19	0.62	BDL	0.64	YES
Odor (TON)	-	-	3	19 of 19	1	1	1	YES
Sodium	-	-	-	19 of 19	7.8	7.3	8.0	N/R
Strontium-90 (pCi/L)	8	-	-	1 of 19	1.8	BDL	1.8	YES
Sulfate	-	-	250	19 of 19	30	28	31	YES
Technetium-99 (pCi/L)	900	-	-	1 of 19	13	BDL	13	YES
Bromodichloromethane	-	-	-	19 of 19	0.011	0.005	0.017	-
Chlorodibromomethane	-	-	-	17 of 19	0.001	BDL	0.002	-
Chloroform	-	-	-	19 of 19	0.062	0.038	0.088	-
Uranium-234 (pCi/L)	-	-	-	2 of 19	0.155	BDL	0.200	YES
Uranium-238 (pCi/L)	-	-	-	2 of 19	0.064	BDL	0.068	YES
Zinc	-	-	5	18 of 19	0.25	BDL	0.64	YES

ALL UNITS ARE IN PPM UNLESS OTHERWISE NOTED IN COLUMN 1

Note 1: Of the 19 original samples taken, 5 tested positive for total coliform, yet tested negative for E.Coli. Following standard protocol, 15 additional samples were taken and tested for total coliform, all of which were negative. See detailed report for additional information.

Note 2: Iron and manganese were exceeded in one drinking water sample out of the 19 locations sampled. It is likely these contaminants in this one sample come from rust in the pipes of the abandoned building (K-1004C).

Footnotes:

MCL = Max Contaminant Level	N/A = Not Applicable	ppb = Parts Per Billion
MCLG = Max Contaminant Level Goal	N/R = Not Regulated	ppm = Parts Per Million
mf/L = Million Fibers Per Liter	pCi/L = Picocuries Per Liter	SMCL = Secondary Max Contaminant Level
	pg/L = Picograms Per Liter	TON = Threshold Odor Number

It should be noted that all drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants and does not indicate the water poses a health risk. The level of regulated contaminants considered to be safe to drink is referred to as the MCL. Another measure of interest for consumers of drinking water is the maximum contaminant level goal (MCLG), which typically is lower than the MCL and considered to be a more desirable level.

The reason most contaminants are present is that drinking water is taken from rivers, lakes, streams, natural springs, and wells. As water travels over the surface of the land or under the ground, it dissolves naturally occurring minerals and radioactive materials such as carbon-14, beryllium-7, potassium-40, and radon. It also picks up substances left by animal or human activity as it travels to its destination. Microbial contaminants may come from septic tanks, livestock, wildlife, and wastewater treatment plants. Pesticides and herbicides come from agricultural and excess residential runoff. Other contaminants come from urban runoff, petroleum products, mining, and industrial wastewater. Contaminants referred to as trihalomethanes or THM (i.e., chloroform, bromodichloromethane, dibromochloromethane, and bromoform) are by-products of the chlorination process and, therefore, are present in all chlorinated drinking water.

Some people are more vulnerable to contaminants in drinking water than the general population. These people should seek advice about drinking water from their healthcare providers. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

**TABLE 2
ANALYTES TESTED FOR AND NOT DETECTED**

Volatile Organic Compounds			
	Styrene	2,4-D	Propachlor
Benzene	1,1,1,2-Tetrachloroethane	Dalapon	Simazine
Bromobenzene	1,1,2,2-Tetrachloroethane	Di (2-ethylhexyl) adipate	Toxaphene
Bromoform	Tetrachloroethene	Di (2-ethylhexyl) phthalate	2,4,5-TP (Silvex)
Bromomethane	Toluene	Dicamba	Radionuclides
Carbon Tetrachloride	1,2,4-Trichlorobenzene	Dieldrin	Cesium-137
Chlorobenzene	1,1,1-Trichloroethane	Dinoseb	Ruthenium-106
Chloroethane	1,1,2-Trichloroethane	Diquat	Stontium-89
2-Chlorotoluene	Trichloroethene	Endothall	Total Uranium Alpha Activity
4-Chlorotoluene	1,2,3-Trichloropropane	Endrin	Uranium-235
Dibromomethane	Vinyl Chloride	Glyphosate	Uranium-236
1,2-Dichlorobenzene	Xylenes, Total	Heptachlor	Inorganics
1,3-Dichlorobenzene	Synthetic Organic Compounds	Heptachlor Epoxide	Aluminum
1,4-Dichlorobenzene		Hexachlorobenzene	Antimony
1,1-Dichloroethane	Alachlor	Hexachlorocyclopentadiene	Arsenic
1,2-Dichloroethane	Aldicarb	3-Hydroxycarbofuran	Beryllium
1,1-Dichloroethene	Aldicarb Sulfone	Lindane	Cadmium
1,2-Dichloroethene (cis)	Aldicarb Sulfoxide	Methomyl	Cyanide
1,2-Dichloroethene (trans)	Aldrin	Methoxychlor	MBAS
1,2-Dichloropropane	Atrazine	Metolachlor	Mercury
1,3-Dichloropropane	Benzo (a) pyrene	Metribuzin	Nickel
2,2-Dichloropropane	Butachlor	Oxamyl	Nitrite
1,1-Dichloropropene	Carbaryl	Pentachlorophenol	Selenium
1,3-Dichloropropene	Carbofuran	Picloram	Silver
Ethylbenzene	Chlordane	Polychlorinated Biphenyls (PCB)	Thallium

Additional Activities

There have been some suspected and confirmed historical cases of cross-connections between the drinking water and the other water and wastewater systems at the site. A review/walkdown of the system is ongoing and, to date, no major problems have been found. Additionally, a plan is being developed to analyze the visible steam plumes. A detailed report will be made available.

LIST OF ABBREVIATIONS AND DEFINITIONS

Below Detectable Limits (BDL): Laboratory analysis indicates the contaminant is not present in a detectable quantity.

Color: The visible water quality factor after suspended solids have been removed.

E.Coli: A strain of bacteria, which is a member of the coliform bacterial group, that can be hazardous to human health.

Maximum Contaminant Level (MCL): The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment (BAT) technology.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety, but are not necessarily regulatory limits.

Million fibers per liter (mf/L): Measure of asbestos fibers present that are longer than 10 micrometers.

Odor: A quality factor affecting acceptability of drinking water that generally is caused by organic and inorganic compounds.

Parts per million (ppm) or Milligrams per liter (mg/L): One part per million corresponds to one minute in two years or a single penny in \$10,000.

Picocuries per liter (pCi/L): Measure of radioactivity in a liquid, in this case water.

Secondary Maximum Contaminant Level (SMCL): Levels related only to aesthetic properties that do not pose a health risk.

Threshold Odor Number (TON): The greatest dilution of a sample with odor-free water yielding a definitely perceptible odor.

Trihalomethanes (THM): By-products of chlorination (i.e., chloroform, bromodichloromethane, dibromochloromethane, and bromoform) that occur in all chlorinated drinking water systems.

Total Coliform: A measurement of the coliform group of bacteria, which is the principal indicator of suitability of water for domestic, dietetic, or other uses.